Midwest Engineer

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FACTS vs. FANCIES
IN AMERICAN INDUSTRY—PAGE TWO

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Midwest Engineer

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CONTENTS

COVER STORY

One of Chicago's newest landmarks is the statue of Alexander Hamilton in Lincoln Park. The memorial to the great American statesman was provided for in a bequest left by Miss Kate Buckingham, wealthy Chicago philanthropist. Cast in bronze and covered with gold leaf, the statue is 9 feet tall. The pylon directly behind it is 70 feet high. John Angel is the sculptor and Marx, Flint and Schonne of Chicago, the architects.

Facts vs. Fancies About American Industry

As Viewed by an Engineer

By Gordon Fox

The confused and unsettled status of our nation and of the world at large is rightly of concern to all of us. Affairs of state may seem to lie in the realm of the economist and the politician but, in a democracy, it behooves us all, as citizens to be, in some measure, informed if we would carry on wisely and successfully. An engineering approach to an understanding of some of the basic factors underlying our economy may therefore be permissible, albeit perhaps unconventional.

Most of us will agree that one potent causes of our unrest derives from the fact that we see about us much poverty and distress. There are too many have-nots, even in relatively affluent America. We cannot be smugly content while many of our neighbors lack even the essentials of a decent life. And our destitute neighbors are naturally, and more or less rightfully, restless with their lot. What's at the bottom of it all? What course will achieve maximum improvement? These are $64 questions of the day.

To many people the answer seems obvious. If you were to take a popular-opinion poll on the street corner, you would be told repeatedly that some folks are too poor because other folks are too rich; that the favored few obtain too much, hence the ordinary many obtain too little; in short, that the root of evil is unfair distribution.

This does sound like a plausible explanation and our engineer is disposed to accept it. But his training requires that he must first subject it to scrutiny. Regardless of its emotional appeal, he he would know whether it is basically sound. As an engineer, he has acquired a profound respect for the underlying laws of Nature. He knows that, by regarding and conforming to those laws, in the realm of the physical, outstanding success has been the reward. Naturally, he seeks to learn what may be the underlying laws of economics and human relation which give promise of similar success. He knows that he who thwarts Nature's laws pays dearly. He suspects that the same is true in the wider spheres of our daily lives. Theories are creations of men but facts are creatures of God.

About one-third of our wealth is represented in housing, furnishings, clothing, jewelry, automobiles, and other items of direct personal use. Statistics show that about 20 per cent of such private wealth in the hand of "wealthy" people, people having annual incomes of $25,000 or more. We may therefore say, admittedly only as an approximation, that if all of the wealth of personal nature, such as estates, houses, yachts, clothing and jewelry held by the "rich" could be confiscated and distributed over the less affluent population, the per capita holding of such wealth by the rank and file would increase about 25 per cent. Such a redistribution of wealth would not cause the poor to become rich, in fact they would still remain poor, only slightly less poor.

Can this result be checked in some manner? Why not look at Russia? There, the wealth of the nobility and the intelligentsia was turned over to the proletariat, but the distress of the prolearíat was alleviated hardly a tittle. In England, too, the rich have been taxed out of existence, but austerity still prevails and the food ration continues but a pittance.

A little more than half of our national wealth is represented in mining, manufacturing, agricultural, and other productive and commercial facilities. This wealth is also non-uniformly distributed, although a considerable portion is broadly held through such intermediaries as insurance policies, investment trusts, endowed institutions, etc. However, it is not adapted to direct use by its owners. It is of value to them only insofar as it produces income. It is, therefore, proper that this wealth be considered primarily with a view to its

Mr. Fox, a life member of the Western Society of Engineers, is vice president of the Freyn Engineering Co., in Chicago. During 1951-52, he was Chairman of the Washington Award Commission.

effect on the distribution of income. Perhaps the underlying cause of our impecuniosity is to be found in the inequitable distribution of income rather than in the non-uniform distribution of existing wealth.

Significant data concerning the distribution of personal income in the U.S.A. during a recent year has been presented by the U. S. National Resources Committee. The figures are typical. They show that about 94 per cent of the national personal income goes to the poor and to those in modest circumstances. Another 6 per cent goes to the relatively affluent group which enjoys an annual income in excess of $25,000. There may be a modicum of truth in the contention that a small sector of our population is unduly rewarded, but a statement seems hardly to be warranted that the share of the national income which accrues to the rich, namely 6 per cent of total personal income, is either inordinately large or is a predominant factor in determining the economic status of our whole population.

"The management and the stockholders take all of the gravy, the workers get only the dregs." This statement has a familiar ring. Is it substantiated by the facts?

Figure 1 shows how the distributable income of American industry for a recent year was apportioned, among employees, management and investors. It will be noted that about 70 per cent went to employees whereas about 5 per cent went each to management and to investors in interest and dividends. This is tantamount to saying that management and investors each received 7 per cent as much as was paid for employee salaries and wages. Thus the maximum benefit which could accrue to wage earners, if the entire amounts now paid to management were diverted to lesser employee wages, would amount to about a 7 per cent increase in such wage. This would be a welcome addition, to be sure, but it would not decisively affect the general status of the worker. If only the alleged "excessive" portion of management's reward were diverted to the employees, the addition to each employee's pay would be hardly discernible.

As a further criterion of this question, we may consider the steel industry, our largest and most important industry. A graph, Figure 2, shows what happened to each dollar of income from sales during 1949. From this chart it will be noted that about a third of the money received from sales was paid out to employees in salaries and wages. Investors, on the other hand, received but 3.2 cents out of each sales dollar, less than one-tenth of the amount paid to employees.

Lest it be stated that this steel industry picture is not representative, we may consider these figures, developed from the income tax returns of the year 1946, for the nation as a whole;

Source of income	Percent of gross personal income
Salaries and wages	$72.23
Dividends	2.72
Interest	1.41
Rents, royalties, individual businesses, partnerships, etc.	Balance

These simple representative investigations lead to three equally simple but exceedingly important conclusions:

(1) A redistribution of existing wealth would have little effect in advancing the status of the poor.

(2) Any feasible readjustment of payments to management can have but a negligible influence on the income of the mass of employees of representative industrial and commercial establishments.

(3) The amount paid in dividends to stockholders is normally so small, in relation to the amount in wages paid to employees that any feasible reduction in dividends would have but a nominal influence on employee incomes.

These three conclusions are wholly sound, though contrary to much that we may have believed or may been told from childhood. They add up to the one fundamental truth.

Faulty distribution, either of wealth or of income, is not the direct, underlying cause of widespread poverty. Changes in distribution of either wealth or income, within any practical bounds, can have only a minute effect on either the wealth or the income of the rank and file in our United States.

If we have digested this fact, we are ready to realize that Communism and Socialism are built on the quicksands of a fundamental fallacy, the fallacy that faulty distribution is the real root of evil and that the material well-being of the average man can be markedly improved through forced changes in distribution of wealth or of income.

These ideologies appeal to the emotions of covetousness and envy and to popular misconception. They do have a minute factual basis, the error being one of gross exaggeration and over-emphasis. They win many converts because of their seeming rationality. They are adopted and promoted by many for selfish reasons of political expediency. But they will not withstand the limelight of dispassionate analysis. Their underlying thesis is predominantly inaccurate.

The organized worker of today is enjoying a higher living standard than did the preceding generation. In a very minor degree this is a reflection of better distribution. But it is primarily and outstandingly due to other factors. They can

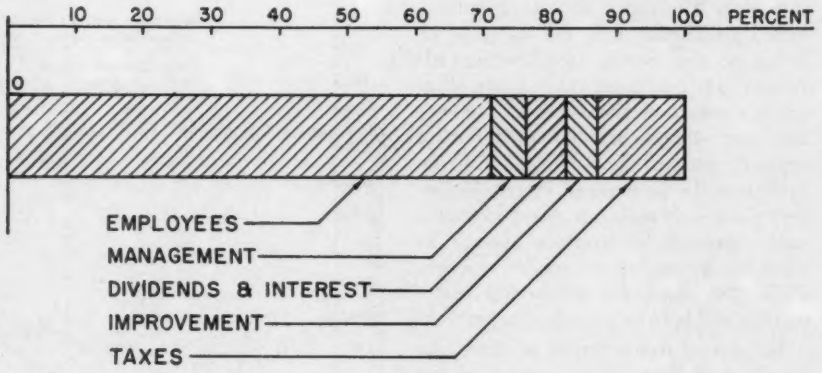
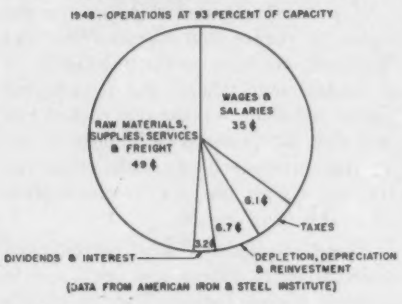


FIG.-1 APPORTIONMENT OF THE DISTRIBUTABLE INCOME OF INDUSTRY IN THE U.S.A.—1945
(U.S. SURVEY OF CURRENT BUSINESS, JULY 1948)

be summed up in the expression "technological advance." Broken down into components, they relate to the enlarged application of electric power to supplant manual power, the contriving and providing of more and better machinery for men to operate and to control, the devising of new materials and new processes, the improvement of instrumentation and control, the increase in safety and

FIG-2
DISPOSITION OF THE SALES DOLLAR
IN THE AMERICAN STEEL INDUSTRY



(DATA FROM AMERICAN IRON & STEEL INSTITUTE)

decrease in lost time thru accidents, the provision of better working conditions, the organization of more effective methods and procedures. Because most of these factors involve plant and equipment, it can be broadly stated that technological advance involves the provision of more tools and better tools per worker. This means the investment of more dollars per worker.

The interrelationship between the improving standard of living of the wage earner and the provision of better tools and more power to back him up should be evident thru comparison of the three curves in Figures 3 and 4. Figure 3 shows graphically how the standard of living of the average worker has advanced over a long period of years. Figure 4 shows how the amount of power used per worker has increased during the same period. Figure 4 also shows the growth in the investment, largely in factory plant or in tools, necessary to enable each employee to produce enough to earn the increasing wages he receives, while permitting his employing enterprise to still hold its place in competition.

Because of technological advance, the standard of living of the people of the United States has undergone steady improvement. A few decades ago the rate of improvement of the standard of living was about 2 per cent per year. More recently, because of keener competition and emphasis on research and efficiency, the stride has been more rapid and the application of technology more general, as in the case of farming. The present rate of improvement in the standard of living is about 4 per cent per annum. As the effect is compounded, this means that the living standard improves about 22 per cent every five years.

The curve in Figure 3 shows graphically the cumulative improvement in living standards which results from the general mathematical theorem of technical advancement at a rate ranging progressively from an initial two per cent to a final four per cent per year over the last four decades. The fine line in Figure 3 is statistical and is based on Dun and Bradstreet's figures for wages and prices from 1850 to 1950. It is consistent with the trend curve and tends to corroborate it. The curve showing the general trend is plotted in terms of the purchasing power, in goods, of one hour's wages, the year 1914 being taken as 100 per cent. It will be noted that the living standard doubled between 1914 and 1936. In 1951 we were able to purchase more than three times as many goods with one hour's work as we could in 1914.

This curve has been extrapolated, based on the assumption that the rate of technological advancement will be maintained. The extension of the curve indicates that, by 1953, our standard of living will have sufficiently advanced so that an employee will then be able to live as well as he would live today if he received not only his own wages but also his share of an assumed divvy of all moneys paid to management. In other words, two years hence the average workman will be as well off as he would be today were all of management's remuneration distributed among subordinate employees. Furthermore, the curve shows that our present rate of advancement in the standard of living is so rapid that, less than five years hence, the average workman will be as well off as he would be today were all of management's compensation and all dividends and interest confiscated and distributed among the lesser employees.

Anyone who comprehends the meaning of Figure 3 must realize that politicians, labor leaders and self-styled liberals who raise a great hue and cry about management's compensation or about dividends and interest, are sadly lacking in perspective. If they were realistic and honest with the facts, they would accede that management must receive a reward commensurate with the responsibility it shoulders and that capital also will not work except for a fair wage. They would acknowledge that the chances of robbing Peter to pay Paul are slim indeed, not worth all the hulabaloo. They would accede to the fact that the real Santa Claus is technological advancement. This Santa Claus has it well within his power, in a very few years, to better the standard of living in far greater measure than any

THE ADVANCE OF THE AMERICAN STANDARD OF LIVING
AS INDICATED BY THE INCREASING PURCHASING
POWER OF ONE HOUR'S WAGES

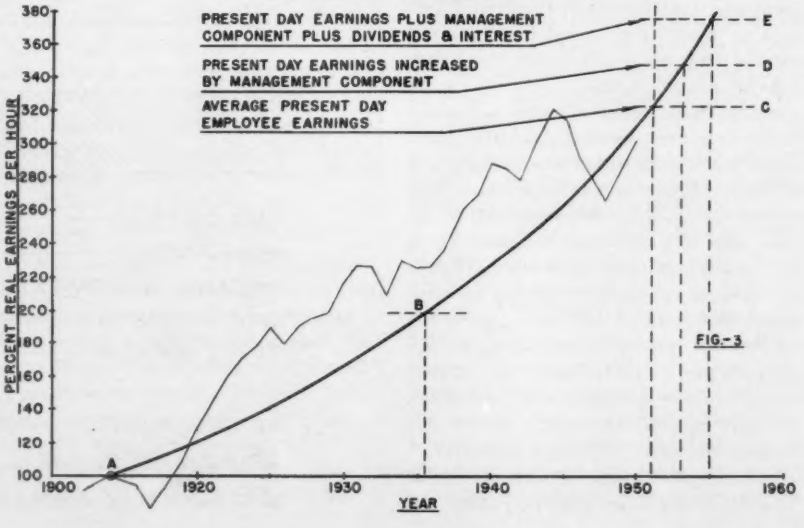


FIG.-3

possible benefit to be derived from a different sharing of today's production.

Let us look at it in another way. We have previously pointed out that management and investors each receive about 7 per cent as much as employees salaries and wages. It is the combination of good management and ample investment in equipment that is responsible for the worker's improvement in status. For a share of the sales dollar one-seventh as large as the worker receives, management and the investor combined have bettered the living standard of the worker more than two-fold in the last two decades.

Have unions been a factor in expediting technological advance? Indirectly, yes. The pressure of mounting wages has impressed upon management the realization that money for labor-saving devices can be hired much more cheaply than man-power. The necessity to economize on high priced labor has been a significant stimulus to improved efficiency in labor utilization, which is just another name for technological advance.

As an indication of how the magic of technological advance operates, Figure 5 may be of interest. This figure shows that while the average hourly earnings of steel workers have increased nine-fold in a third of a century, the composite price of steel products has less than tripled. Today an hour's work will buy three-fold more product. This figure shows merely one example, typical of thousands.

The hope for higher standards of material well-being for all rests in promoting technological advance and in producing more wealth per capita so that there may be more goods to distribute in proportion to the recipient population. Prosperity and abundance for the many is not basically a problem in division and subtraction; it is primarily a matter of multiplication and consequent addition. If we would prosper, it behooves each of us to contribute his best effort and to forego such negative practices as boon-doogling, featherbedding, and striking, which diminish the total of distributable goods and inevitably lower the average standard of living of the whole people. We must accept the irrefutable truth that wealth can be distributed only insofar as wealth is created and wealth cannot be created through methods of restriction and sabotage.

It is of the utmost importance that we fully comprehend in what direction we must seek improvement of our status as a nation with consequent benefit to ourselves as its citizens. It is essential that we realize the folly of the course of contention and strife to which we have of late years been committed. We must somehow learn that the way of envy, coveteousness, class antagonism and demagogy is a dead end street; it can lead only to ruin. We must, at long last, envision the fact that the goals we seek are not to be found awaiting us at the end of a rainbow, they cannot be decreed by dictum, lured by laws, invoked by "deals" or conjured by wishful thinking; they must be captured, as we would capture a fort, by aggressive attack, by concerted action, by constructive cooperation, by energetic endeavor, by manifest mutuality, by unselfish understanding. We must

(*Continued on Page* 18)

GROWTH IN POWER USE AND IN PLANT FACILITIES

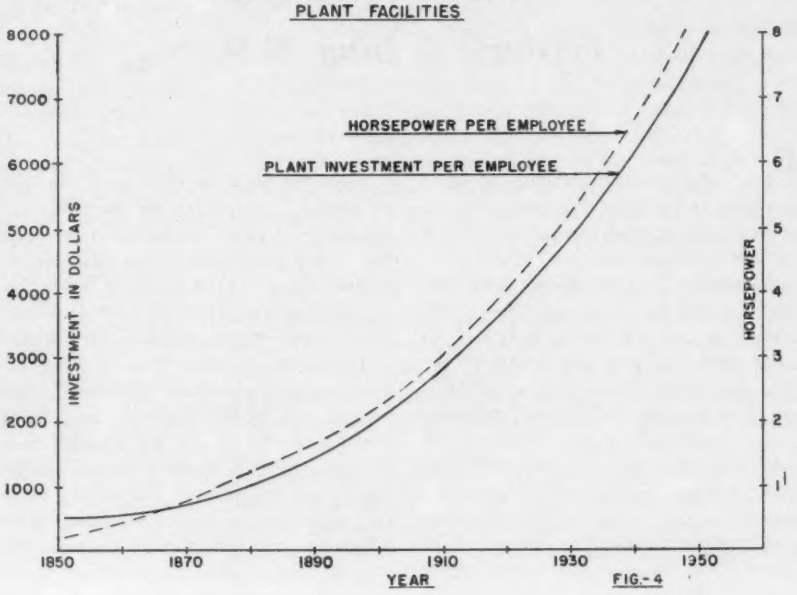


FIG.-4

HISTORICAL RELATIONSHIP
HOURLY EARNINGS AND STEEL PRODUCTS PRICES

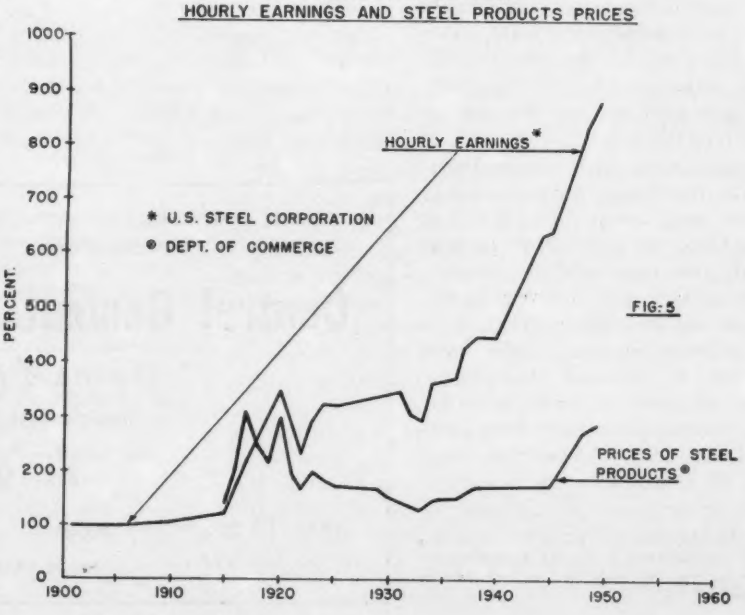


FIG: 5

Repairs and Replacements

in the

Human Machine

Frederic T. Jung, M.D.

The young engineer embarking upon his career is legitimately concerned, for his own sake, in health hazards latent in any new occupational environment. These hazards have increased since ionizing radiations, such as those from radioactive isotopes, are becoming more widely used and since new chemicals are being constantly introduced as solvents, detergents and pesticides. An intelligent person necessarily must consider the possibilities that insanity and sterility, among other results, may follow exposures to new physical or chemical agents. This raises the question of repairs and replacements, since some kinds of damage, such as simple fractures, are pretty well repaired and some losses, such as hemorrhage, are easily replaced by transfusions or transplantations. The point of this presentation, however, is that some kinds of losses are never made good and that this applies especially to the brain.

Various authors have amused themselves, as did Edgar Allan Poe more than 100 years ago in "The Man that was Used Up," by listing all the parts of the body that one could live without. The list grows longer each year as surgeons become more clever. One of the latest additions is part of the heart called the left auricular appendage, which is amputated in the operation for mitral stenosis. Remarkably large parts of the brain can also be removed, but it is essential to note that here the lost portions of nervous tissue are never replaced by freshly regenerated nervous tissue but by mere space-filling connective tissue. If the injury is limited in extent, neighboring parts may be able to take over some of the necessary work.

The brain recovers poorly from asphyxia, from poisoning by solvents like benzol and methyl bromide, and from mechanical injury by wounds and blows. There is nothing humorous in motion picture comedies depicting mental confusion or unconsciousness from blows on the head. The unconsciousness or confusion caused by knockout blows in pugilism represent anatomical, physical injury to the brain, and these injuries are cumulative. In pugilism the physician's examination ought to be directed at the brain rather than the heart, and an athlete with a brain worth saving should not be allowed to box. Mild degrees of insomnia, irritability, and subtle personality changes may be the first indications of occupational injury to the brain. An extreme case is that of two foreigners who were working in a fruit-packing establishment when they became irrational and were jailed as uncontrollable marijuana addicts. They were not cleared of this ugly suspicion until some 50 other workers also showed physical and mental symptoms that were traced, finally, to the use of methyl bromide in fumigating the fruit.

Equally striking, perhaps, is the case of the human ear. The structure of the sensory apparatus in the auditory labyrinth is delicate to a degree that can hardly be suggested without the help of charts and microscopes, but once it is appreciated one can see that gross injuries are simply irreparable. Finer dislocations, such as occur in the hair-cells of the cochlea from blasts or from continued loud noises, result in the degeneration of nerve cells. The damage is often so gradual in its appearance that its connection with the noise may not be suspected, and the victim of impaired hearing may undergo much mental suffering before he recognizes the trouble and receives the understanding and cooperation from society that would make his lot easier. The noises now produced in industry and in warfare surpass anything in human history. It is to be hoped that improvements in mufflers, noise-level meters, and other devices for noise-control will keep pace with these developments.

Thus, engineers are asked not only to watch their own health but also to make sure that newly designed equipment and processes do not involve built-in health hazards to the bodies, sense-organs and brains of prospective users.

Dr. Jung is assistant secretary of the Council on Physical Medicine and Rehabilitation of the American Medical Association. He presented this talk before a Wednesday Noon Luncheon Meeting on October 17, 1951.

Reviews of Technical Books

Available at WSE Headquarters

Radio Circuitry

Radio and Television Receiver Circuitry and Operations, by Alfred A. Ghirardi and J. Richard Johnson, Rinehart Books, Inc., New York, N. Y. First edition, 1951. 669 pages. $6.00.

This book is designed as the first book of a modern radio and television servicing library. It provides the radio technician and student with complete information on circuits now in use in home receiver installations. It covers circuits, antennas, materials of construction, principles of operation and explanations of AM, FM, and TV forms of transmission. Modern recorders, record changers, and pickup devices are given expert attention.

Throughout the book the treatment is nonmathematical and couched in terms familiar to all radiomen. A 26-page glossary at the end of the text provides the beginner with immediate clarification of words or expressions.

There are numerous examples to illustrate the subject matter in each chapter, and a comprehensive index.

H.P.H., W.S.E.

Plant Layout

Plant Layout, Planning and Practice, by Randolph W. Mallick and Armand T. Gaudreau, John Wiley and Sons, Incorporated, New York, N. Y. First edition, 1951. 391 pages. $7.50.

This book is written with the administrative executive and plant engineer in mind, it also serves as a handy guide for senior and junior engineers, and as a reference for engineering colleges and schools of business administration.

The modern plant layout integrates factory grounds, buildings, floors, departments, machine tools, processing equipment, manufacturing methods, material handling equipment, service facilities, flow of production, utilization of labor, and shipment of the finished product unto a unified master plan. They stress the designing of plant facilities because it is felt that much of the high speed and increased capacity available in processing units cannot be utilized unless facilities for servicing production are correspondingly improved.

The bibliography containing hundreds of pertinent references will be particularly helpful.

A very practical book by practical men: It is well illustrated and has numerous tables, charts, check lists, forms for analysis and plant layouts.

H.P.H., W.S.E.

Fluid Dynamics

Fluid Dynamics, by Victor L. Streeter. McGraw-Hill Book Co., Inc., New York, N. Y. First edition, 1948. 263 pages. $6.00.

This new text for advanced students of the general theory of fluid flow puts its emphasis on the solution of problems to clarify theoretical material. In the preparation of this book the author has drawn heavily on Lamb's *Hydrodynamics,* the undisputed authority on the subject.

The book introduces the reader to the classical theory of fluid flow and covers the ideal fluid theory for both two and three-dimensional flow, as well as the theory for viscous flow. Mathematics beyond calculus has been introduced and developed in the text.

The plan of the book is this: First is formulated the basic ideal fluid theory, followed by examples of three-dimensional flow. Then the necessary concepts in complex variables are introduced, so that all two-dimensional flow cases may be approached from the viewpoint of conformal mapping. Free streamlines are introduced with several examples of their use.

Vortex theory is then developed, with two and three-dimensional examples. The Navier Stokes equations are derived and applied to several flow problems, including the laminar boundry layer. Diagrams and index complete the books.

J.C.L., W.S.E.

Plain Concrete

Plain Concrete, by Edward E. Bauer, McGraw-Hill Book Company, Inc., New York, N. Y. Third edition, 1949. 430 pages. $5.00.

The third edition of this well known textbook and laboratory manual gives to the engineering student professional background in the field of concrete. It presents a thorough discussion of the fundamental problems of concrete production together with instructions for the performance of laboratory tests.

Emphasis is placed on the characteristic of materials used in concrete; calculations of mixes; making, placing, curing, controlling, and testing concrete.

Liberal use is made of A.S.T.M. specifications, and the entire Part II is devoted to the performance of tests in the laboratory.

A series of projects is incorporated to give the student first hand information regarding the interrelationship of the many factors involved in the manufacture of good concrete.

H.P.H., W.S.E.

WSE Applications

In accordance with the By-Laws of the Western Society of Engineers, the following names of applicants are being submitted to the Admissions committee for examination as to their qualifications for admission to membership into the Society in the various grades, i.e., Student, Associate, Member, Affiliate, etc. All applicants must meet the highest standards of character and professionalism in order to qualify for admissions, and each member of the Society should be alert to his responsibility to assist the Admissions committee in establishing that these standards are met. Any member of the Society, therefore, who has information relative to the qualifications or fitness of any of the applicants listed below, should inform the Secretary's office, 84 E. Randolph St., RAndolph 6—1736.

8-84 Leo G. Pryma, Structural Designer, Leonard Construction Co., 37 S. Wabash Av.

9-84 George Y. Taylor, Assist. Div. Oper. Engr., Public Service Company of Northern Illinois, P. O. Box 278, Glencoe, Ill.

10-84 Ruth E. Chinlund, President-Treasurer, Jackson Electrical Construction Co., 111 W. Washington St.

11-84 Barrett A. Sleeman, General Outside Supt., Bulley & Andrews, 1755 W. Armitage Av.

12-84 James D. Josephs, Party Chief, Jas. Anderson Co., 290 E. Deerpath, Lake Forest, Ill.

13-84 Roger L. Rae, District Service Supervisor, Westerlin & Campbell Co., 185 N. Wabash Av.

14-84 Charles H. King, Engineer #2, Public Service Company of Northern Illinois, 72 W. Adams St.

15-84 Daniel J. Hanson, Traffic Engr., Chicago Motor Club, 66 E. South Water St.

16-84 Charles T. Mickle, Senior Civil Engineer, Sanitary District of Chicago, 910 S. Michigan Av.

17-84 Charles W. DeLand, Vice President, C. W. Johnson, Inc., 6138 N. Clark St.

18-84 Edwill H. Pritchard, President, Western Materials Co., 39 S. LaSalle St.

19-84 Harold J. Robertson, Draftsman-Designer, Lester B. Knight & Associates, 650 S. Clark St.

20-84 Emil W. Hinspater, Vice President—Mfg., Nuclear Instrument & Chemical Corp., 223 W. Erie St.

21-84 Chester E. Gottschalk, Supt. of Plant Facilities, Armour Research Foundation, 35 W. 33rd St.

22-84 Leslie H. Fenical, Draftsman, Cardox Corp., 307 N. Michigan Av.

23-84 Norman E. Schmidt (Rein.), Deputy Bldg. Commissioner, City of Evanston, Evanston, Ill.

24-84 Thomas C. Cihlar, Assistant Engineer, Commonwealth Edison Co., 2233 S. Throop St.

Edgar S. Nethercut, Secretary Emeritus, Dies

The passing of Secretary Emeritus Edgar S. Nethercut on July 18, 1952 was an event of deep sorrow to members and friends of the Western Society of Engineers.

Mr. Nethercut, one of the society's most distinguished members during his long engineering career, was its secretary from 1917 through 1935 and its secretary emeritus from 1935 until death ended his eventful career.

When, in 1935, Mr. Nethercut asked to be relieved of his active responsibilities of secretary in order that he might devote his time to travel and historical research, a testimonial in his honor recorded that he had all of the qualifications of a great secretary of a great society—a psychologist, a philosopher, a diplomat, a statesman, an editor, a statistician, an economist, a scholar, a writer, a moderator, a student and a reader.

Seventeen years later, when he passed away, time had failed to dim any of these observations of 1935. Throughout his 35 years of service to the society as secretary and secretary-emeritus, his faithful, conscientious and constructive work contributed mightily to the writing of the most brilliant chapter in the history and development of the Western Society of Engineers.

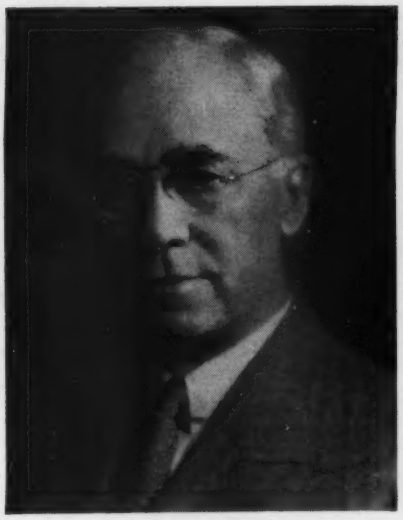
During Mr. Nethercut's term as secretary, the society more than trebled its membership and assumed its rightful place in national, state, local and industrial affairs.

During this long and fruitful period in the society's history, Mr. Nethercut's unlimited patience, tireless efforts and constructive helpfulness to the many administrations he so ably served, left a deep and abiding impression on the organization.

Mr. Nethercut was born at Lake Geneva, Wisconsin, June 12, 1866, the son of George S. and Mary Bell (McConnell) Nethercut. He joined the Western Society of Engineers on July 9, 1892 and became an active member in October, 1904.

Miss Grace Goodnough, to whom he was married on April 28, 1896, passed away in 1934.

Mr. Nethercut was graduated from the University of Wisconsin in civil engineering in 1889. After serving an apprenticeship as a draftsman with Wade & Purdy and with the Bullock Printing Press Company, he joined Paige Iron Works and Buda Company in 1891 where he became successively chief engineer, sales manager and director. Mr. Nethercut terminated his connection with the latter organization in 1907 and spent the next ten years in professional practice as an engineering consultant in Chicago, New York and Washington, D.C. In addition to his service to the Western Society of Engineers, he was an active participant in the affairs of the American Society of Civil Engineers and the Franklin Institute.



MR. NETHERCUT

With a sincere desire to share with his countless friends and associates in honoring the memory of Edgar S. Nethercut, therefore be it

RESOLVED: That this testimonial be entered in the records of the Western Society of Engineers and published in the MIDWEST ENGINEER as an expression of our enduring regard for an admired associate, an esteemed counselor, and a faithful friend.

The Western Society has been saddened to learn that during the past few weeks several of its well known members have passed away.

On July 20, John C. Penn, retired professor of civil engineering at the Illinois Institute of Technology, died. Mr. Penn joined Western Society in 1906 and became a Life Member in 1942. At one time he was dean of the Armour Institute of Technology.

* * *

Theodore Bockman, a member of the Western Society of Engineers since 1948, died July 31 at the age of 52. Mr. Bockman graduated from the Illinois Institute of Technology in 1925 with a B.S. degree in chemical engineering. He was associated with the U. S. Gypsum Co., from 1926 to 1934 when he went to the Universal Oil Products Co. From 1938 until the time of his death, Mr. Bockman was coordinating and process engineer for that company.

* * *

One of Western Society's oldest members, Samuel French Nichols, died August 17. Mr. Nichols, who was 87 years old, joined the Society in 1896 and became a Life Member in 1938.

After several years of teaching in boys' preparatory schools, after his graduation from Amherst College in 1887, he entered the electrical engineering field. In 1894 he came to Chicago and formed a partnership with his brother. They became pioneers in the application of electricity as the motive power for drawbridges and railroad turntables, and were manufacturers of various railroad equipment. In 1931 he became president of the firm now known as the Nichols Engineering Co. Mr. Nichols retired in 1949.

Background and Development of the Centennial of Engineering

The 100th anniversary of the separation of civilian engineering from military engineering in this country is the occasion for celebrating a century of engineered progress in 1952. The celebration will reach its climax in September, with a great convocation in Chicago.

The American Society of Civil Engineers, which came into being in 1852, as the first national engineering society in the United States, set its sights on its centennial year in the hope of making its 100th anniversary an occasion in which all branches of engineering would join. This ambition is being realized, so that the Centennial of Engineering betokens the accomplishments and future of every branch of engineering rather than being commemorative of the single society that was founded 100 years ago.

Backbone of the convocation is found in events arranged by the corporation, Centennial of Engineering, 1952. These special events are not a responsibility of any of the participating societies. The program will give to engineering and to the general public a remarkable series of twelve symposia on major subjects. These sessions are distributed throughout the convocation period, September 3 to 13. Each will be conducted by an eminent chairman and the main speakers will be distinguished experts in their respective fields. Papers will be presented in language understandable to the layman. In short, these symposia will be of large popular interest and accomplish a great deal in realizing the purpose of bringing about a better public understanding of engineering and reasons why America has become great.

Also included are a reception for foreign delegates on September 3 and significant ceremonies on September 10 which is designated as Centennial Day. The latter will include a special luncheon and an all-inclusive evening party.

That an extraordinary interest is being taken in the Convocation by the entire profession of engineering is evident from the fact that 51 engineering organizations have scheduled meetings in addition to the symposium programs during the September period. Thirty-nine of them will hold technical sessions, and, in a number of instances two or more organizations will collaborate in joint sessions. The attendance is expected to reach 25,000.

Obviously, a tremendous amount of work is necessary to develop and coordinate the many hundreds of technical sessions and other functions involved in the meetings of so many societies during the eleven-day period. Each society has full responsibility for arranging its own meeting, subject to general co-ordination under the over-all supervision of a Convocation Committee of the Board of Directors of the Corporation. This great task rests in the hands of two Committees composed of representatives from each of the participating societies. One is the Coordinating Committee on Technical Programs under the chairmanship of Mr. G. Donald Kennedy, Assistant to the President of the Portland Cement Association. The second is a corresponding Committee on General Arrangements under the Chairmanship of Mr. Howard F. Peckworth, Managing Director of the American Concrete Pipe Association. The two committees meet jointly every month and all plans are progressing very satisfactorily.

The thirty-nine units of engineering which are planning technical sessions are:

American Association of Engineers, American Chemical Society (Chicago Section), American Concrete Institute, American Geophysical Union, American Institute of Architects, American Institute of Chemical Engineers, American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Iron and Steel Institute, American Meteorological Society, American Public Health Association (Engineering Section), American Railway Engineering Association, American Association for the Advancement of Science, American Society of Agricultural Engineers, American Society of Civil Engineers, American Society for Engineering Education, American Society of Lubrication Engineers, American Society of Mechanical Engineers, American Society of Refrigerating Engineers and the American Society of Safety Engineers (Chicago Chapter).

Also, the American Society for Testing Materials, American Society of Tool Engineers, American Standards Association, American Welding Society, Armour Research Council, Association of Consulting Management Engineers, Chicago Technical Council, Illuminating Engineering Society, Industrial Management Society, Institute of Radio Engineers, Institute of Traffic Engineers, National Conference on Industrial Hydraulics, Society for Advancement of Management, Society of American Military Engineers, Society of Automotive Engineers, Society of Naval Architects and Marine Engineers, Society of Women Engineers.

Several special programs will be presented in addition to the exhibits. One will be a symposium on the afternoon of Tuesday, September 9, in which top leaders in major fields of chemistry will talk on prospective developments for the world's progress in their special fields.

The second will be a symposium on industrial uses of atomic energy, scheduled for Thursday, September 11. The whole day and evening will be given over to a series of definitive papers by authoritative speakers on practical details such as supply and cost of fission products and their possibilities, how to design tracer studies and case histories of specific uses. The evening session will hear a speaker yet to be chosen, on the economic, social and political aspects of atomic energy in industry.

The atomic energy program will be tied in with a series of exhibits on the same subject, in cooperation with the Atomic Energy Commission.

Other special events will be a half-day program for students, a continuous showing of chemical motion pictures, the chemists' art exhibit and the "chemical trail-blazers' exhibit" of entirely new ideas in chemistry.

Museum of Science and Industry To Lay "Living" Cornerstone

Chicago's Museum of Science and Industry will lay a "living" cornerstone September 3, opening day of the two-week convocation of the Centennial of Engineering, September 3-13. Although the building dates back to 1893 when it was erected for the World's Columbian Exposition, the cornerstone was never laid.

Commemorating 100 years of American engineering achievements, the cornerstone will be set in place in a simple ceremony attended by a group of 500 foreign engineers who will be special guests of the Museum that day which has been designated "International Day" by the Centennial. Lenox R. Lohr, president, and D. M. MacMaster, director of the Museum, will officiate at the ceremony.

Where traditional cornerstones are concerned with the history and mementoes of the past, the Museum stone will be dedicated to the future. Everything in the cornerstone will be physically or biologically "alive," symbolizing the Museum's concern with present accomplishments and the promise of the future as exemplified in its exhibits. It is hoped that many of the articles to be secreted within the stone will provide the answers for some of the research problems of today. Marking the present atomic age of discovery, some of the stone's contents will be radio-active, pulsing with the atomic life that holds so much promise for the engineers and scientists of tomorrow. A specially constructed "clock" will count off not seconds or minutes but years inside the cornerstone.

In the heart of the one-ton granite block will be a carefully fabricated monel metal box, wherein, surrounded by an inert gas, helium, will be a number of laboratory experiments designed to prove or disprove some of today's theories in an experiment that will last 100 years.

Among the contents will be small amounts of dry hydrogen and oxygen in the proper proportions to form water (H_2O) / (two volumes of hydrogen and one of oxygen) which should react very slowly due to the absence of any catalyst. According to some scientists, no reaction will take place within a hundred years; others, however, believe it will take place within that time with violence.

In another sealed capsule will be Oriental lotus seeds, traditionally associated with longevity. When that section of the box is opened after a hundred years have passed, scientists will have more accurate data on which to predicate the ability of seed to maintain germination qualities.

The Museum's purpose in determining the contents of its cornerstone is to provide the opportunity of conducting long experiments which no research laboratory can afford the time or maintain the test conditions to conduct. Experiments to be conducted in this way were determined by a group of scientists at the University of Chicago and through consultation with other scientists in the various fields concerned.

An experiment in slow change will be included in the field of crystallization. Under normal laboratory conditions it is impossible to make observations of this type for a long enough period; and if the experiment is speeded up a different crystalline structure will result.

Among the contents of the stone will be a small lead block plated on one surface with a very thin layer of a radio-active lead isotope (with a half life of 22 years). When the stone is opened scientists will be interested in determining to what depth the radio-activity of the isotope has penetrated or sunk in the block as well as in the amount of radio-activity still remaining in the material.

In another metallurgical experiment, a sample of an age-hardening metal alloy (a recent material) will be included. After a hundred years, this alloy should show increased properties of hardness and strength.

Several varieties of biological molds, including the mold that is used to produce penicillin, will also be placed in the stone. These will be in a state of suspended activity during their incarceration and after a hundred years they will be allowed to resume their biological activity if they have survived the test.

Along the same lines, several kinds of virus and bacteria will be similarly

tested to determine their longevity for the hundred year period.

Counting off the years until the cornerstone is re-opened will be a thermostatic clock especially constructed for the purpose. Designed on the same principle as the ordinary room thermostat to control temperature, the cornerstone's clock consists of two strips of metal that expand differently with temperature changes. Thus the thermostat will be set to register once when Chicago's temperature passes 85° and then will not register again until the temperature has gone below 15°. In this way it is expected that summer and winter weather in Chicago, despite its wide fluctuations, will operate the clock set within the stone.

Mass Spectrometer At Northwestern U.

A mass spectrometer, used in the study of gaseous material, has been given to the chemical engineering department of the Northwestern University Technological Institute by the H. S. Martin company of Evanston, it was announced by Professor L. F. Stutzman, chairman of the department.

Valued at $10,500, the University plans to add another $10,000 worth of equipment to the unusual electronic machine to make it into a mass spectrograph.

The spectrograph will be used in research analyses of liquid and gaseous samples which can be vaporized. The one-ton machine will scan and record the content analyses on a chart with speed and precision, and will also enable Northwestern scientists to study combinations they have heretofore been unable to analyze. Some mixtures are so complex it is impossible to analyze them by old methods, Dr. Stutzman said.

The machine, primarily used in the petroleum industry, is the latest addition to the analytical laboratory of the chemical engineering department. Partly through the efforts of Dr. R. K. Summerbell, chairman of the chemistry department, an infra-red machine is also being procured. The laboratory is being air-conditioned because of the addition of the spectrograph and the infra-red machine.

Dr. Stutzman said the mass spectrograph, to be operated by a full time specialist, will be available to other schools and departments of the University such as chemistry, physics, engineering, medicine and dentistry.

The Martin company is now installing the spectrometer. Conversion by the University to a spectrograph is expected to be completely by early fall.

The Evanston firm, a glassware producer which has been making tubes for the machine and testing them on the gift model, has also offered to instruct the scientists in its operations.

IIT Announces Plans For New Buildings

Illinois Institute of Technology has announced that it will begin construction this fall of the second new building to be started on its south side campus this year.

The newest building will be a laboratory for use by the Association of American Railroads Central Research Laboratory, it was disclosed by Dr. John T. Rettaliata, president of the Institute. The new building will cost approximately $350,000 and will be located north of the present A.A.R. laboratory on the campus.

Construction began last month on a nine-story apartment building for Illinois Tech staff members and students. Located on 32nd street, between Wabash and Michigan avenues, the 96-unit building will cost $1,085,000. It is scheduled for completion by June 15, 1953.

Illinois Tech has completed 12 new buildings on its projected 110-acre campus since 1943. Design of the structures and the overall campus plan have been the work of famed architect Ludwig Mies van der Rohe, director of architecture at IIT.

The new laboratory building will enlarge present facilities for an accelerated program of railroad research by the A.A.R. The one-story structure will be used primarily to house mechanical engineering.

Design of the new laboratory will fit in with the modern structures already completed on the campus of the Institute, Dr. Rettaliata said.

The original laboratory for A.A.R.'s

use was dedicated in May, 1950. Its location was selected by the organization "to permit a close relationship with the staff of the Institute and provide for an exchange of ideas and procedures."

William T. Faricy, A.A.R., has explained that the new building will be devoted entirely to working laboratory space with administrative offices remaining in the present two-story central laboratory. The additional space will expand facilities, he said, and speed up present experimentation.

Rubber Bureau Exhibit

The Natural Rubber Bureau featured a rubber road exhibit at the 1952 Public Works Congress and Equipment Show held in Los Angeles, August 24 through 27.

A unique feature of the Bureau's exhibit was a simulated roadway that ends in an actual top and bottom course section cut from an existing asphalt-rubber pavement. The Exhibit also featured engineering material developed in the new Natural Rubber Bureau Research Laboratory. This material graphically underscores the Bureau's contention that rubber roads provide highways which last longer with less repair.

During the Convention, attending engineers had the opportunity to see the actual laying of a natural rubber road by the City of Los Angeles. The Convention also was the occasion of the premier of the Natural Rubber Bureau's new motion picture, "Stretching Highways Dollars with Rubber Roads."

Special Engineering Movie

A special motion picture entitled "Miracles for Millions" is to be produced as one of the features of the Centennial of Engineering now being celebrated in Chicago. It will be a full color portrayal of the part engineering has played in building the high standards of American living and will be released for distribution throughout the country.

Main purposes of the movie, which will be a 16 mm. sound production, will be to interest more young people in adopting engineering for their careers, according to Lenox R. Lohr, president of the Centennial.

"It should create increased appreciation for the men and machines that enrich our daily lives, and renew faith in the future of America where man's visions will be engineered into reality," he said.

As one means of attaining contact with the prospective engineers of tomorrow, the movie will be given special circulation in schools and before professional societies. It will also be available for church and civic bodies.

Crerar Library

Notes and News

Two important scientific events taking place during the first two weeks in September will give the Library an opportunity to present exhibits of interest to engineers and other technical personnel. During the Centennial of Engineering there will be an extensive showing of recent technical books in the exhibit hall on the fourth floor of the building. It is expected that some 300 European engineers will visit the Library during the Centennial, during the auspices of the U. S. Mutual Security Agency.

The second exhibit will be staged at the Seventh National Chemical Exposition, September 9-13 at the Chicago Coliseum. Principal emphasis at this exhibit will be the collections of the Library and the services of Research Information Service.

Mr. William Stone Budington has been appointed Associate Librarian of The John Crerar Library, effective October 1, 1952. Mr. Budington will come to Crerar from Columbia University where he has been Engineering Librarian the past five years, in charge of the libraries of Engineering, Chemistry, Physics, Mathematics and General Science. Prior to his appointment at Columbia he was reference librarian at Norwich University and instructor in electrical engineering at Virginia Polytechnic University. He was in the army 1942-46, serving in the Manhattan Project 1944-46.

Mr. Budington is a graduate of Williams College and has a degree in Electrical Engineering from Virginia Polytechnic Institute. He is also a graduate of Columbia University School of Library Service. He is a member of Phi Beta Kappa and two honorary engineering fraternities, Tau Beta Pi (Engineering) and Eta Kappa Nu (Electrical Engineering). He is a member of the American Society for Engineering Education as well as professional library associations.

Mr. Kenneth H. Fagerhaugh, assistant librarian at Crerar since 1950, took over a new job on August 1 as Librarian of Carnegie Institute of Technology in Pittsburgh. He came to Crerar on April 1, 1948 as Research Librarian in charge of Research Information Service, and became Assistant Librarian when Mr. Kanardy L. Taylor left to join the Army Medical Library in Washington. Mr. Taylor is now Chief Librarian of that great library, which has since become the Armed Forces Medical Library.

Chamber of Commerce Development Committee

The Chamber of Commerce of the United States has announced appointment of a 34-man Construction and Civic Development Committee for 1952-53, headed by Norman P. Mason, treasurer of the Wm. P. Proctor Co., North Chelmsford, Mass.

The committee includes five Chamber directors and representatives of all segments of the building industry from every section of the country.

During the year, the committee will consider such subjects as major factors affecting construction markets (both privately and publicly financed), government control of materials, credit and rents, and the planning of private and public construction projects.

The committee also will concentrate on a program for more and better apprentice training in the building trades, more intensive research in the construction field, and modernized city planning, zoning, and building codes.

Construction costs are climbing because of the recent steel strike and higher labor rates, *Engineering News-Record*, McGraw-Hill publication, reports.

The magazine's Construction Cost Index for August spurted 2.5 per cent higher than July and was 7.8 per cent higher than August, 1951. The Building Cost Index for August increased 2.2 per cent over last month and 5.9 per cent over a year ago.

The increases in the price of steel since Korea, brought the cost from $3.40 to $3.91 a hundredweight, a boost of 15 per cent.

The magazine's Skilled Labor Index shows an average rise of 36.8 cents an hour, or 14.6 per cent.

Eighth Annual Electronics Conference

The eighth annual National Electronics Conference will convene September 29, 30 and October 1, 1952 at the Sherman Hotel, Chicago.

The greatly expanded technical program offers 99 papers covering a broad field of Electronic Research, Development, and Industrial Application and is supplemented by over 75 exhibits by manufacturers and institutions foremost in the electronics field.

On the social side, the conference sponsors three luncheons featuring prominent speakers, an evening banquet, and a full three day social program for the ladies. Two evenings are available for viewing the exhibits or visiting any of the famous entertainment spots which are only a few steps from the Hotel Sherman.

The conference is sponsored by the American Institute of Electrical Engineers, Illinois Institute of Technology, Institute of Radio Engineers, Northwestern University, University of Illinois with Purdue University, University of Wisconsin and the Society of Motion Picture and Television Engineers participating.

Advance registration may be made by writing to National Electronics Conference, Inc., Karl Kramer, Executive Secretary, 852 East 83rd Street, Chicago 19, Illinois.

UPADI Plans New Orleans Meeting

The third convention of UPADI (Pan-American Federation of Engineering Societies) will be held in New Orleans, La., Aug. 25-30, 1952. Latest reports indicate that the meeting will attract approximately 200 engineers representing the professional societies throughout Central and South America. The site and time were chosen to permit the Latin delegates to participate in the observances commemorating the Centennial of Engineering.

UPADI is a relatively new organization. It was formed to provide a common meeting ground for Western Hemisphere engineers, a means to discuss mutual problems, and an opportunity to exchange ideas and information.

The first UPADI Congress was held in Rio de Janeiro, Brazil, in July, 1949. Almost all Latin societies attended, and Engineers Joint Council sent official observers. At the meeting a number of papers were presented and a provisional constitution drawn up. This document was negotiated and revised during the period following the congress. At a convention in Havana, Cuba, in April, 1951, UPADI was formally constituted. Shortly thereafter EJC signified its adherence to the organization.

Program High Lights

The third convention in New Orleans will consider further revisions in the Constitution and adopt a set of by-laws. A technical program will be held on August 26. Its theme will be engineering education. The program is being developed by Leo J. Lassalle, dean, college of engineering, Louisiana State University. The general philosophy of engineering education will be explored together with post-graduate training of engineers. Problems and plans for expansion in this field will also be discussed. Two papers prepared by Latin delegates will be presented during the morning session. In the afternoon papers on the situation in the United States and Canada will be delivered.

While a good part of the Convention will be devoted to organization and business, arrangements have been made to inspect the facilities of the Port of New Orleans and visit plants in the vicinity. Various social affairs are scheduled including a formal banquet on August 29th. A program for the ladies is also being planned.

Meetings at Tulane

The Convention will meet at Tulane University where living quarters have been provided for the delegates. Air-conditioned McAlister Auditorium will be the center of the Convention activities. Spanish-English interpreters will be on hand to take care of the convention proceedings. A special UPADI Committee under the chairmanship of James M. Todd has set up various subcommittees to handle details of the convention. Each local section of the Founder Societies has a member on these committees.

The President of UPADI is Luis Giannattasio of Montevideo, Uruguay. He will serve through 1954. James M. Todd, past-president, ASME, chairman of the special UPADI Committee and in charge of arrangements for the New Orleans meeting, is vice-president. Manuel J. Puente of Havana, Cuba, is treasurer. Representatives of societies in Argentina, Brazil, Canada, Colombia, El Salvador, and Honduras make up the board of directors.

A cordial invitation is extended to all engineers to attend the various sessions.

Information, Please!

The MIDWEST ENGINEER always wants news about the activities of the members of Western Society. If you've changed your position, have gotten a promotion or have any other news that would interest our readers, please write to the MIDWEST ENGINEER, 84 E. Randolph, Chicago 1.

W. S. E. Women's Council Announces Centennial Program

The Western Society of Engineers was founded in 1869 for the advancement of the theory and practice of engineering, the improvement of the status of engineering practice as a profession, and the maintenance of high professional standards. As the Society approaches its own not too far distant Centennial in this year of the "CENTENNIAL OF ENGINEERING" it is proud of its distinguished and far reaching membership. Included in the membership list for many years were a few women engineers. However, in 1946 W.S.E. decided to make a concentrated effort to enlist women members into its ranks. A short time later the Western Society of Engineers added another unit to its twelve specialized sections and divisions. This became the Professional Women's Council. The objects of this division, consistent with those of the now 83 year old Western Society of Engineers, is to further the interests of women in the technical professions (its members limited to those) eligible for membership in W.S.E.; to improve the status of women in the practice of these professions; to maintain a high professional standard among women in these professions, as well as to aid and encourage qualified undergraduate women interested in these professions. Miss Mary Ann E. Crawford, graduate of Massachusetts Institute of Technology and licensed architect and engineer, is Chairman of the Western Society of Engineers Professional Women's Council for the coming year.

At the Western Society of Engineers' Convention, Thursday, September 4th, the luncheon speaker will be William V. Kahler, President of the Illinois Bell Telephone Co. Mr. Kahler, Past President of the Western Society of Engineers, has titled his talk "The 'Welcome' Sign is Out for Women Engineers." Chairman of the luncheon, to be held at the Society's Headquarters, 84 E. Randolph St., will be Dr. Gustav Egloff, Director of Research, Universal Oil Products Co. Mr. H. P. Sedwick, Executive Vice President of Public Service Co. of Northern Illinois will introduce Mr. Kahler. Both Dr. Egloff and Mr. Sedwick are Past Presidents of W.S.E.

Miss Crawford will preside as chairman at the afternoon session. The following women engineers will be speakers at this meeting, the program of which was arranged by the W.S.E. Professional Women's Council.

Miss Margaret Ingels, the first speaker, is the first woman to graduate from the University of Kentucky's College of Engineering. Miss Ingels is Engineering Editor of Carrier Corporation, Syracuse, N. Y., and has titled her talk "Petticoats and Slide Rules." At the present time she is working on the book tentatively-titled "Memoirs of Willis H. Carrier, Father of Air Conditioning," a man with whom she was a close working associate for thirty-three years. Miss Ingels has had many articles published on air conditioning and its varied phases and these have appeared as part of technical societies' transactions, in technical and trade magazines, and the popular type of magazine. Miss Ingels began her engineering career in Chicago with the Chicago Telephone Co., Traffic Engineering Dept.; then went with Carrier Engineering Corp.; the American Society of Heating and Ventilating Engineers at the U. S. Bureau of Mines Pittsburgh—Research Laboratory; a member of the N. Y. Commission on School Ventilation-Field Tests, and back to Carrier Corporation. She is a member of the American Society of Heating and Ventilating Engineers, and the Technology Club of

Miss Ingels

Syracuse, of which she is a member of the Board of Governors.

Mrs. Lois Graham McDowell, the first woman to receive a Master's degree in mechanical engineering from the Illinois Institute of Technology, will speak on "Educating Women for Engineering." Mrs. McDowell is ably fitted to discuss the subject as she is an instructor and assistant to the director of the Mechanical Engineering Department of IIT. She has been working with the committee of IIT on revision and bringing up-to-date study courses in engineering, as well as working toward her doctorate. She is a graduate of Rensselaer Polytechnical Institute, and attended Syracuse University. She is a member of Western Society of Engineers, Pi Tau Sigma, Tau Beta Pi, Sigma Xi, and other professional societies.

Miss Beatrice A. Hicks, Vice President and Chief Engineer of the Newark Controls Co., Bloomfield, N. J., will speak on "Our Untapped Source of Engineering Talent." She is the immediate Past President of the Society of Women Engineers.

Armour Research Foundation To Sponsor Conference

Armour Research Foundation of Illinois Institute of Technology will sponsor a Centennial Conference on Industrial Research Tuesday, September 9, during the Centennial of Engineering.

Some 300 research executives from industries throughout the country are expected to attend the Conference, according to John P. Skinner, Conference chairman. The meeting will be held on the Illinois Tech campus.

Plans for the Conference were announced by Mr. Skinner, who is assistant manager of program development at the Foundation. Theme of the meeting will be "Where Do We Go From Here with Industrial Research?"

Harry A. Winne, vice-president in charge of engineering policy for the General Electric Co., Schenectady, N.Y., will speak at the Conference luncheon. At an afternoon session, a panel of experts will discuss significant trends, opportunities, and problems confronting the industrial executive who deals with scientific research and development.

Major events on the day's program will be Mr. Winne's speech, the panel discussion, and informal group discussions about specific research interests.

Taking part in the panel will be Winne; James Shennan, president, Elgin National Watch Company; Dr. Howard Turner, director of research and development, Pittsburgh Consolidation Coal Company; and A. Allan Bates, vice president of the Portland Cement Association.

William A. Casler, assistant director of research at the Foundation, will act as moderator of the panel discussion. Dr. Haldon A. Leedy, director of the Foundation, will welcome those attending the conference.

Two Promotions at Portland Cement Assn.

The appointment of Leo H. Corning as Director of Promotion and of Thor Germundsson as Manager of the Structural and Railways Bureau of the Portland Cement Association was announced, effective Aug. 1, by C. D. Franks, the Association's Executive Vice President.

In his new capacity, Mr. Corning will supervise the promotion work of the Association's general office staff at 33 W. Grand Ave. in Chicago. Widely recognized as one of the nation's outstanding authorities on reinforced concrete construction, he has been a member of the Association staff for 23 years.

Mr. Corning received his B.S. degree in civil engineering from Case Institute of Technology. After duty in the Coast Artillery Corps of the U. S. Army during World War I, his wide range of work in the structural field included service as a designer with the M. A. Hanna Co. of Cleveland, structural engineer for the Foundation Co. of Chicago, engineer of design for the Cleveland Water Department, and a period of private practice as an engineer and architect in Florida.

Mr. Corning joined the staff of the Association's Structural Bureau in 1929, was appointed Assistant Manager of that Bureau in 1935, and Manager in 1949—the post he held at the time of his appointment as Director of Promotion.

(*Continued from Page* 5)

progress in phalanyx, as a cooperative multitude, we cannot hope to progress as fast or as far, working as contentious individuals or invidious pressure groups.

Karl Marx propounded the principle that Communism was founded "on the dynamic force of class antagonism." Let us therefore realize that the full success, 'The American Way,' can only evolve from the Christian concept of classless collaboration in furtherance of the common weal.

It was indicated in Figure 4 that the investment required, to enable enterprise to function competitively, increased, between 1930 and 1950, from about $4800 to about $8000 per employee, an increase of more than $3000. As related to a working force of the magnitude of 50 million persons, this means that it was necessary to invest some such amount as 50 million x $3000 = $150 billion, or $7.5 billion per year, as an average, to build up America's productive plant in such manner as to make possible the improvement in living standards which were effected in these two decades. Furthermore, as our working force increases at a rate approximating ½ million persons per year, it is necessary that there be invested some such amount as 500,000 x $8000 = $4 billions per year if industry will absorb the annual increase in employables. The combined investment need is of the magnitude of $12 billion per annum.

Why has America outstripped the world in her standard of living? In large measure it is because she has been able to find the wherewithal to meet the demand for funds for investment in ever more productive plant. And why could it meet this demand? Because enough people have been able and willing to save and to invest rather than to spend for personal goods or pleasures. It is imperative to our whole economic structure that this situation be maintained. If we fail to sustain the necessary rate of investment in productive plant, we will fail to sustain the four per cent rate of technological advance which is the root of our betterment of living standards and we will fail to absorb the annual flood of new employables.

These figures indicate broadly that personal savings are presently of such magnitude as to cover the need of our productive development if the savings are so directed.

It is essential that we note the sources of these all-important savings. Statistics show that they are derived almost entirely from persons having annual incomes in excess of $4000, that is from persons in the two upper fifths of our income population.

This then, leads to the conclusion that the people in the upper income brackets are actually the benefactors of those in the lower brackets because the former save and supply the wherewithal which is the very root of the improvement in living standards for the latter.

It may be argued that the persons of lower income have less margin to permit saving. True enough. But it should not be overlooked that improving living standards put more and more people in position to save and to prosper. The cycle has inherent in it, potentialities for far reaching and ever expanding benefits, if we will but cultivate them rather than blight them.

In recent decades science has placed at the disposal of man, tremendous potentialities for the attainment of abundance, leisure, culture and enjoyment. But man has not proven equal to their assimilation. He has become so engrossed in a scramble for spoils that he fails to envisage the greater goal, the pot of gold for all, attainable through production.

Perhaps man should heed the brief creed which underlies the scientist's success, simply; 1) Learn the laws of the universe. 2) Obey them.

We should accept and live up to the Law of Supply and Demand, the Ten Commandments and the Golden Rule, and turn the limelight on producing rather than despoiling.

Engineering Societies Personnel Service, Inc.

New York Chicago Detroit San Francisco

84 East Randolph St., Chicago 1, Ill., ST ate 2-2748

These items are from information furnished by the Engineering Societies Personnel Service, Inc., Chicago. This SERVICE, operated on a co-operative, non-profit basis, is sponsored by the Western Society of Engineers and the national societies of Civil, Electrical, Mechanical and Mining and Metallurgical Engineers. Apply to ESPS, Chicago and the key number indicated. Prepared ENGINEERS AVAILABLE advertisements limited to 40 words, with typed resume attached may be submitted to ESPS Chicago by members of Western Society of Engineers at no charge.

If placed in a position as a result of an Engineers Available or Position Available advertisement, applicants agree to pay the established placement fee. These rates are available on request and are sufficient to maintain an effective non-profit personnel service. A weekly bulletin of positions open is available to subscribers. Apply ESPS Chicago.

OVER THE MANAGER'S DESK

Finding the right position or finding the right man for a position usually requires the help of a third party who understands the current market conditions. The E.S.P.S. staff has had the experience and is in constant contact with the current market conditions for men and positions. If you will make your needs known to us we may be able to come up with some solutions to your problems. B.H.A.

POSITIONS AVAILABLE

R-9084(d) SALES—Gears. M.E. Age: 30-45. 2 plus yrs. exp. in sales of gears or transmission products. Duties: selling a line of custom built gears sold to automobile companies. Salary: Up to $15,000 a yr. Location: Chicago. Travel 50% of time. Car required. Employer will pay the fee.

R-9093 CHEMICAL ENG. PROCESS. Educ: Chem. Eng. Age: Up to 55. Knowledge of sulphuric acid plants and processes. Duties: project work on chemical process work for a sulphuric acid plant. For a consultant. Salary: Up to $9500. Location: Chicago. Employer will negotiate fee.

T-9094 WELDING ENGINEER Graduate. Age: to 45. Know: resistance welding of all types, metal arc and fusion welding. Metal will be nickel chromium alloy steel. Duties: Analyze welding problems and determine the corrective action to be taken. Will set up welding procedures to be used in production processes. Determine welding eqpt. requirements and confer with vendors in developing standard and special equip. Salary: to $6600. Location: Ohio.

R-9096 PROCESS ENGINEER Age: Up to 55. Sheet metal background. Know: punch press operations and dies. Duties: processing sheet metal products from blue prints. Salary: $500-$600 Mo. Location: Chicago.

R-9097 JOB ACCOUNTANT Age: Up to 45. 2 plus yrs. exp. in construction costing, time keeping and account keeping. Duties: Field accounting and cost work. Also timekeeping for a contractor. Salary: Up to $130 per week. Loc: Chicago. Employer will negotiate the fee.

T-9099 PROJECT ENGINEER Degree, M.E. preferred. Age: to 30. 3 yrs. exp. in plant maintenance. Duties: Plant maintenance. Plant maintenance; plan and draw all new construction originating at the plant, survey building sites, calculate materials needed, design and draw new machinery. Manufacturing Co. of Cement. Salary: $425 a month. Loc: Ohio. Employer will not pay the Fee.

R-9100 ELECTRICAL DESIGNER. EE. Age: Up to 40. 2 plus yrs. exp. in utility work on distribution or design. Know: hydro-electric plants helpful. Duties: designing work for hydro-electric power plants and systems. For Consultants. Salary: Up to $6500 yr. Location: Chicago.

R-9102 DIRECTOR OF ENG. & RESEARCH. M.E. or Chemistry. Age: 32-50. 3 plus yrs. exp. in administrative capacity in product development. Know: plastics and mechanical products. Duties: directing and coordinating engineering and research for development of semi-consumer products. For Mfg. Salary: $13,000—$18,000. Loc: Michigan.

R-9103 GEAR PRODUCTION SUPERVISOR. ME Degree of Eq. Age: 35-45. 7 yrs. exp. Production processing of gears and gear housing. Duties: Asst in the plant layout and set up for a complete transmission production operation. Following this, assume full responsibilities for operation of the dept. Manufacturing of Tractors. Salary: $7200 plus. Loc: NW Chgo. Suburb. Employer will negotiate the fee.

R-9105 GEOLOGIST Educ.; Geology. Age: 21-35. Recent Grads or better. Know: ore dressing technique helpful. Duties: petrography of ore samples and minor ore dressing preparations. Maybe some field work. Salary: $3900 to $5,000 yr. Loc: Chicago.

ENGINEERS AVAILABLE

PATENTS ENG. EE 28 One yr. Project engineer designing and developing relays and switches. Five yrs. doing investigation of electrical equip. to determine if hazardous. Specialized on industrial control equipment and temperature indicating and regulating equipment. Three yrs. in the U.S. Navy in charge of electrical division on board ship. Duties were to operate and maintain all electrical equipment, except the radio. Chicago $5000 391 MW.

DEVELOPMENT ENGINEER ME 26 Two yrs. Sales-Engr. in charge of customer relations and sales, out of town correspondence. Also production engineering & std. cost, processing and methods on special metal products. Two mos. collecting time studies for std. data. $5400 Chicago 392 MW.

SALES ENGINEER ME 25 Seventeen mos. Mech. Eng. making layouts, preparing & checking drawings for shop fab. & field erection of high press. & temp. boilers. Three mos. working on assembly line. $4600 Midwest 393 MW.

FIELD ENGINEER CE 25 Six mos. draftsman preparing of drawings in ink of charts, graphs, etc. for use in concrete pipe handbook. Three mos. preparation of working drawings of reinforced concrete and steel. Six yrs. proofreader, reading galley proofs of newspaper articles, classified and display advertisements, checking for grammatical and typographical errors. $3300 West & Foreign 396 MW.

CHIEF ENG. ME 29 One yr. Project eng., in charge of design and development of bulk material handling & conveying for plants, doing processing, plant layout, structural design, specifications, and special machines. Three yrs. Design Engineer, doing design of industrial bldgs., conveyors & machinery for coal plants, salt mines etc. Five yrs. Asst. Plant Eng., mechanical eng. of material handling systems and special production equip., machinery, jigs etc. $10,000 Chicago 397 MW.

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